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**Biology Gene Regulation & Mutation (Chapter 12 Outline)**

*Vocabulary*: Define in your own words

Double helix-

Nucleosome-

Semiconservative replication-

DNA polymerase-

Okazaki fragment-

RNA polymerase-

Exon-

Intron-

Codon-

Operon-

Mutation-

Mutagen-

Respond to the following prompts:

Give a description of the three major experiments that led to the discovery of DNA as genetic material. Be specific in your explanation of how each experiment pertains to the discovery of DNA as genetic material. (3 pts)

Explain Chargaff's rule. (1 pt)

What is the basic structure of the eukaryotic chromosome? Explain. (2 pts)

What is the role of enzymes in the replication of DNA? Explain. (2 pts)

How does DNA replication compare in eukaryotes and prokaryotes? Describe how DNA replication is similar and different between prokaryotes and eukaryotes. (2 pts)

How are the messenger RNA, ribosomal RNA, and the transfer RNA involved in the transcription and translation of genes? Describe the role of each type of RNA in the process of making proteins from DNA. (6 pts)

How are bacteria able to regulate their genes by two types of operons? Explain. (2 pts)

Explain how eukaryotes regulate the transcription of genes. Include a discussion on transcription factors, Hox genes, and RNA interference. (3 pts)

What are the various types of mutations? Explain each major type of mutation in detail. (6 pts)

**Write three things that you learned about Gene Regulation and Mutation***:*

*Make sure to write a full sentence.*

***Example sentence****: I learned that there are 20 amino acids that are determined by their three letter sequence of RNA nucleotides, which are called codons.*

*1.*

*2.*

*3.*